






### Section 1 – Identification

<b>Product Identifier: Non-Spillable Batteries</b> Technical Name(s): Sealed Lead-Acid Batteries (SLA), Valve Regulated Lead-Acid Batteries (VRLA), Absorbed Glass Mat Batteries (AGM), Sealed Lead Calcium Batteries, Sealed Maintenance Free Lead-Acid Batteries	
<b>Manufacturer:</b> <b>GS Yuasa Corporation</b> 1 Inobanba-cho, Nishinosho, Kisshoin, Minami-ku, Kyoto, Japan 601-8520 Phone # 81-75-312-1211	<b>Supplier:</b> <b>GS Battery – Canada</b> 2754 Lancaster Road Ottawa, Ontario Canada K1B 4S4 Phone # 613-228-5000
<b>In Emergency Phone 1-800-267-3534 in U.S.A. and Canada (Toll Free) 24 hours</b> <b>Or (01) 613-228-5000 (Collect) between 8:30AM and 5:00PM Monday to Friday.</b>	
<b>Product Use: Electric Storage Battery</b>	
<b>Prepared by: Environmental, Health and Safety Department; GS Battery – Canada (613-228-5000)</b>	
<b>Prepared date: November 26, 2014 (Not Valid after November 26, 2017)</b>	
<b>Trademarks:</b>     	
This MSDS applies only to products bearing the GS logo and/or the GS Yuasa logo and one of the above other three trademarks.	


### Section 2 – Hazards Identification

#### GHS Classification

<b>Health</b>	<b>Environmental</b>	<b>Physical</b>
Acute Toxicity – Not listed Eye Corrosion – Corrosive* Skin Corrosion – Corrosive* Skin Sensitization – Not listed Mutagenicity / Carcinogenicity – Not listed Reproductive / Developmental – Not listed Target Organ Toxicity (Repeatedly)- Not listed	Aquatic Toxicity - Not listed	NFPA –Flammable gas, hydrogen (under severe overcharge conditions) CN- Not listed EU- Not listed

\* as sulfuric acid

#### GHS Label: Valve Regulated Lead Acid Battery, Non-Spillable

<b>Symbols:</b> C (Corrosive) 	<b>Hazard Statements</b> Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin.
	<b>Precautionary Statements</b> Keep out of reach of children. Do not attempt to remove cover. Avoid heat, sparks and open flame while charging batteries. Avoid contact with internal acid.

Cont'd...

## Section 2 – Hazards Identification...continued

### 2.1 Emergency Overview

Non-spillable batteries are sealed and do not leak or vent gasses under normal conditions. Under severe overcharge conditions venting of sulfuric acid gas and hydrogen can occur. Hydrogen gas is extremely flammable. Most hazards are presented during reclamation (recycling). If battery is ruptured or damaged, exposure to sulfuric acid electrolyte and lead can occur. Some battery terminals contain lead. After contact with terminals, wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses.

#### **Sulfuric Acid**

Appearance: colourless, oily fluid; vapours are colourless with acrid odor. Sulfuric Acid is a strong corrosive. Contact with sulfuric acid can cause burns on the skin and in eyes. Exposure to sulfuric acid fumes will cause respiratory and eye irritation, difficulty breathing, headache, nausea, and weakness. Severe overexposure may cause lung edema (swelling from fluid retention). Ingestion of Sulfuric Acid will cause GI (gastrointestinal) tract burns. Each non-spillable battery contains only enough sulfuric acid to saturate fiberglass separators, so a large spill is not likely to occur. Hazard is primarily through direct contact with internal components or through inhalation of gases under severe overcharge conditions. Sulfuric acid vapour is considered carcinogenic to humans (Group 1) by the International Agency for Research on Cancer (IARC).

#### **Lead (Pb) and Lead Compounds**

Appearance: bluish white, silvery grey. Lead may be absorbed through intact skin. Absorption or ingestion of lead may cause poisoning, central nervous system depression, kidney damage, reproductive toxicity and fetal effects. The toxic effects of Lead are accumulative and slow to appear. The symptoms of Lead overexposure are anemia, vomiting, headache, stomach pain (lead colic), dizziness, loss of appetite and muscle and joint pain. Exposure to lead from a battery most often occurs during lead reclaim operations and through the breathing or ingestion of lead dust or fumes. Lead is dangerous to the environment. Lead is considered carcinogenic to animals at extreme doses (Group 2B) by the International Agency for Research on Cancer (IARC).

#### **Fiberglass Separator**

Fiberglass is an irritant of the upper respiratory tract, skin and eyes. Fiberglass is not considered carcinogenic by NTP or OSHA.

### 2.2 OSHA Regulatory Status

This article is considered hazardous by the OSHA HCS, WHMIS, IOSH, ISO and by EU Directive (67/548/EEC) and an MSDS is required for this article considering that when used as recommended or intended, or under ordinary conditions, it may present a health and safety exposure or other hazard.

### 2.3 Potential Health Effects

#### **Sulfuric Acid**

- Eye:** Corrosive. Causes redness, pain and severe deep burns.
- Skin:** Corrosive. Causes redness, pain, blisters and serious skin burns.
- Ingestion:** Corrosive. Ingestion of sulfuric acid causes abdominal pain, burning sensation, shock or collapse.
- Inhalation:** Corrosive. Inhalation of sulfuric acid may cause burning sensation in the nose and respiratory tract, sore throat, cough, laboured breathing, shortness of breath. Inhalation of sulfuric acid fumes may cause lung edema (swelling from fluid retention). Symptoms may be delayed and may not become apparent until a few hours have passed and lungs have been aggravated by physical effort.
- Chronic:** Chronic exposure to sulfuric acid fumes may cause lung damage. There is risk of tooth erosion upon repeated or prolonged exposure to sulfuric acid fumes.

## Section 2 – Hazards Identification...continued

### Lead (Pb) and Lead Compounds

- Eye:** Causes eye irritation.
- Skin:** Causes skin irritation. May be absorbed through skin.
- Ingestion:** Toxic. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of lead compounds can cause toxic effects in the blood forming organs, kidneys and central nervous system. Symptoms of lead poisoning or plumbism include weakness, weight loss, lassitude, insomnia, and hypertension. It also includes constipation, anorexia, abdominal discomfort and colic.
- Inhalation:** Toxic. May cause respiratory tract irritation. Inhalation of lead fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause effects similar to those described for ingestion.
- Chronic:** Chronic exposure may cause reproductive disorders and teratogenic effects. Chronic exposure to lead may result in plumbism, which is characterized by lead line in gum, headache, muscle weakness and mental changes.

### 2.4 Potential Environmental Effects

Sulfuric acid is harmful to aquatic organisms. Trace amounts of lead can make water unfit for consumption. Sulfuric acid and lead can contaminate food and feedstuffs.

See also: Section 11 – Toxicological Information for additional data.

## Section 3 – Composition / Information on Ingredients

Under normal use and handling there is no contact with internal components of battery. Under normal use and handling batteries do not emit regulated or hazardous substances. After contact with terminals, wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses. If battery is damaged all listed precautions should be taken to prevent exposure.

Components	CAS Number	EC Number	% Weight	OSHA Regulatory Status
<b>Lead (Pb)</b>	7439-92-1	231-100-4	about 50%	Hazardous
<b>Lead Dioxide (PbO<sub>2</sub>)</b>	1309-60-0	215-174-5	about 10%	Hazardous
<b>Lead Sulfate (PbSO<sub>4</sub>)</b>	7446-14-2	231-198-9	about 10%	Hazardous
<b>Calcium (Ca)</b>	7440-70-2	231-179-5	about 0.05%	Hazardous
<b>Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>)</b>	7664-93-9	231-639-5	about 20%	Hazardous
<b>Fiberglass Separator</b>	65997-17-3	266-046-0	about 5%	Hazardous
<b>Acrylonitrile Butadiene Styrene Case</b>	9003-56-9	618-371-8	about 5%	Non- Hazardous
<b>Tin (Sn)</b>	7440-31-5	231-141-8	0 - 0.25%	Non- Hazardous
<b>Arsenic (As)</b>	7440-38-2	231-148-6	about 0.2%	Hazardous

Ingredients reflect components of a finished product.

## Section 4 – First Aid Measures

Non-spillable batteries are sealed and do not leak or vent gasses under normal conditions. Venting of sulfuric acid gas and hydrogen can occur under severe overcharge conditions. During lead reclaim operations, or if battery is ruptured or damaged, exposure to sulfuric acid electrolyte and lead can occur.

- Eye Contact:** Sulfuric acid electrolyte. Immediately flush with water for 20 minutes, lifting the upper and lower lids. Get immediate medical attention.
- Skin Contact:** Sulfuric acid electrolyte. Immediately flush with water for 20 minutes. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists, if area is large or if blisters form.
- Inhalation:** Sulfuric acid fumes. If irritation develops, remove victim to fresh air and get medical attention. Give CPR (Cardiopulmonary Resuscitation) if breathing has stopped.
- Ingestion:** Sulfuric acid electrolyte. Do not induce vomiting. Do not give anything by mouth to an unconscious or convulsing person. Flush out mouth with water. Give water or milk to drink followed by milk of magnesia or vegetable oil. Get immediate medical attention.
- Lead (Pb):** The toxic effects of Lead are accumulative and slow to appear. If symptoms appear see your physician.

**After any contact with internal components of the battery, wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses.**

## Section 5 – Fire Fighting Measures

### 5.1 Flammable Properties

Sealed batteries can emit Hydrogen, vaporized sulfuric acid or highly toxic arsine gas in a fire.  
Sealed batteries can emit Hydrogen while being over-charged. (Float Voltage in excess of 2.40 Volts Per Cell at 25° C / 77° F).

### 5.2 Extinguishing Media

Provided that batteries are not part of an electrical circuit, use any media appropriate for surrounding fire (including water, dry chemical, foam, CO<sub>2</sub>, Halon).

If batteries are part of an electrical circuit, isolate them from power source at the circuit breaker before using water to extinguish fire. If this cannot be done immediately, then water must not be used as an extinguishing media.

### 5.3 Protection of Firefighters

Ventilate the area well. NIOSH approved SCBA and full fire-fighting turn out gear is recommended.

**Unusual Fire and Explosion Hazards:** Keep lighted cigarettes, sparks and flames away. Explosion can result from improper charging and ignition of resulting gases. Explosion can result if charged in gas tight container. Hydrogen can burn with almost an invisible flame of low thermal radia. People have unknowingly walked into hydrogen flames. Hydrogen is easily ignited.

## **Section 6 – Accidental Release Measures**

**Steps to be taken if battery vents hydrogen or sulfuric acid gas:** Sealed batteries can emit Hydrogen while being over-charged. (Float Voltage in excess of 2.40 Volts Per Cell at 25° C / 77° F). Keep well ventilated and away from flame, spark or heat. If concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA approved respiratory protection.

**Steps to be taken if battery is broken:** Avoid contact with sulfuric acid electrolyte. Each non-spillable battery contains only enough sulfuric acid to saturate fiberglass separators, so a large spill is not likely to occur. If leak occurs, dilute with water, neutralize with sodium bicarbonate (baking soda), sodium carbon (soda ash) or calcium oxide (lime) until fizzing stops. Hydrogen gas may be given off during neutralization, provide adequate ventilation. The pH should be neutral at 6-8. When neutralized the spill is non-hazardous and can be flushed down the sewer. Do not allow unneutralized acid to enter the sewage system. Broken battery contains lead and should be treated as hazardous waste. Place broken battery in a heavy gauge plastic bag or other non-metallic container and follow disposal procedure as per Section 13 below.

## **Section 7 – Handling and Storage**

Store indoors in a cool, dry, well ventilated area away from combustibles and activities that may create flame, spark or heat. Do not store in sealed, unventilated areas. Do not use organic solvents on the batteries. Do not allow metallic tools to short across terminals, as spark may occur. Do not wear metallic jewelry when working on small batteries as dangerous short circuit and severe burns may occur. There is risk of electric shock from strings of series-connected batteries even when not hooked up to charger. Sealed batteries can emit Hydrogen while being over-charged. Do not allow float voltage to exceed 2.40 Volts Per Cell at 25° C / 77° F. Do not remove vent covers.

## **Section 8 – Exposure Controls & Personal Protection**

### **8.1 Engineering Controls**

Charge in areas with adequate ventilation. General dilution ventilation is acceptable.

### **8.2 Personal protective equipment (PPE)**

- a) Under normal conditions no protection is required.
- b) If battery is ruptured follow precautions in Section 6 and use the following protective equipment:

**8.2.1 Eye/face Protection:** Safety glasses or goggles recommended to handle battery if case is damaged.

**8.2.2 Skin Protection:** Use acid-resistant gloves to handle battery if case is damaged. An acid-resistant apron is also recommended for large clean-up operations.

**8.2.3 Respiratory Protection:** When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA approved respiratory protection.

**8.2.4 General Hygiene Conditions:** After any contact with internal components of the battery, wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses. Discard lead contaminated clothing in a manner that limits further exposure. After contact with terminals, wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses.

### **8.3 Exposure Guidelines & Limits**

Under normal conditions there is no risk of exposure other than to lead (Pb) through contact with the terminals. If case is damaged, or during reclaim operations, the following table should be observed.

Cont'd...

## Section 8 – Exposure Controls & Personal Protection...continued

### 8.3 Exposure Guidelines & Limits...continued

Components	CAS Number	ACGIH TLV	OSHA PEL	NIOSH REL	NIOSH IDLH	Quebec PEV	Ontario OEL
Lead (Pb)	7439-92-1	0.05 mg/ m <sup>3</sup>	0.05 mg/ m <sup>3</sup>	0.05 mg/ m <sup>3</sup>	100 mg/ m <sup>3</sup>	0.15 mg/ m <sup>3</sup>	0.10 mg/ m <sup>3</sup>
Lead Dioxide (PbO <sub>2</sub> )	1309-60-0	0.05 mg/ m <sup>3</sup>	0.05 mg/ m <sup>3</sup>	0.1 mg/ m <sup>3</sup>	100 mg/ m <sup>3</sup>	0.15 mg/ m <sup>3</sup>	0.10 mg/ m <sup>3</sup>
Lead Sulfate (PbSO <sub>4</sub> )	7446-14-2	0.05 mg/ m <sup>3</sup>	0.05 mg/ m <sup>3</sup>	0.1 mg/ m <sup>3</sup>	100 mg/ m <sup>3</sup>	0.15 mg/ m <sup>3</sup>	0.10 mg/ m <sup>3</sup>
Calcium (Ca)	7440-70-2	None Listed	None Listed	None Listed	None Listed	None Listed	None Listed
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	7664-93-9	0.2 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Fiberglass Separator	Not Listed	None Listed	15 mg/m <sup>3</sup>	5 mg/ m <sup>3</sup>	None Listed	None Listed	None Listed
Acrylonitrile Butadiene Styrene	9003-56-9	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Tin (Sn)	7440-31-5	2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	100 mg/ m <sup>3</sup>	2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>
Arsenic (As)	7440-38-2	0.01 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	3 ppm	0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>

## Section 9 – Physical & Chemical Properties

### Flammable Properties

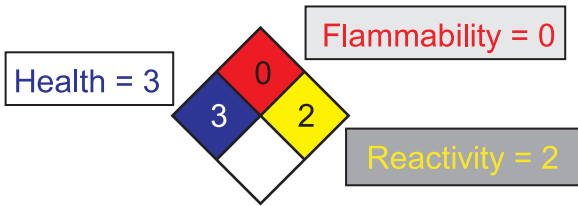
#### Battery (Finished Product)

<b>Flash Point:</b> Not Applicable		<b>Autoignition Temperature:</b> Not Applicable
<b>Flammable Limits:</b>	<b>LFL:</b> Not Applicable	<b>Flammability Classification:</b> Non-Flammable Solid (Per 29 CFR 1910.1200)
	<b>UFL:</b> Not Applicable	

#### Hydrogen (Emission)

<b>Flash Point:</b> Gas @ normal temperature		<b>Autoignition Temperature:</b> 500° C (932° F)
<b>Flammable Limits:</b>	<b>LEL:</b> 4.1%	<b>Flammability Classification:</b> Flammable Gas (Per 29 CFR 1910.1200)
	<b>UEL:</b> 74.2%	

### Hazard Ratings

<b>NFPA Hazard Rating</b> (for Sulfuric Acid)		Flammability (Red) = 0 Health (Blue) = 3 Reactivity (Yellow) = 2	<b>Hazard Rating Key:</b>
			0 = minimal 1 = slight 2 = moderate 3 = serious 4 = severe

Cont'd...

**Section 9 – Physical & Chemical Properties...continued**
**Component Properties**

Component	Lead	Lead Sulfate	Lead Dioxide	Sulfuric Acid	Fiberglass Separator	Arsenic
Appearance	Silver-Grey Metal	White Powder	Brown Powder	Clear Colourless Liquid	White Fibrous Glass	Colourless Solid
Odor	None	None	None	None to Acidic	None	None
Odor Threshold	N/A	N/A	N/A	Greater than 1 mg / m <sup>3</sup>	N/A	N/A
Physical State	Solid	Solid	Solid	Liquid or Gas	Solid	Solid
pH	N/A	N/A	N/A	2 or lower	N/A	N/A
Melting point	327.4° C (621.3° F)	1070° C (1958° F)	290° C (554° F)	N/A	800° C (1472° F)	817° C (1502° F)
Freezing Point	N/A	N/A	N/A	11° C (51.8° F)	N/A	N/A
Boiling point	1740° C (3164° F)	1170° C (2134° F)	1070° C (1958° F)	114° C (237° F)	Unknown	6135° C (11,075° F)
Evaporation rate	N/A	N/A	N/A	> 1	Unknown	Unknown
Flammability	N/A	N/A	N/A	N/A		Unknown
Upper flammability explosive limit	N/A	N/A	N/A	Unknown	Unknown	Unknown
Lower flammability explosive limit	N/A	N/A	N/A	Unknown	Unknown	Unknown
Vapour pressure	1.3 mm Hg @ 970° C	Unknown	Unknown	.00120 mm Hg @ 20° C	Unknown	Unknown
Vapour density	N/A	N/A	N/A	Unknown	Unknown	Unknown
Specific gravity	11.34	6.2	9.375	1.290 ±.010	2.6	1.020
Solubility in Water	None	0.43 mg / l @ 15° C (59° F)	None	100%	None	Infinitely Soluble
Partition coefficient: n-octanol/water	N/A	N/A	N/A	N/A	N/A	Unknown
Auto-ignition temperature	N/A	N/A	N/A	Unknown	N/A	Unknown
Decomposition temperature	N/A	N/A	N/A	Unknown	N/A	Unknown
Molecular Formula	Pb	PbSO <sub>4</sub>	PbO <sub>2</sub>	H <sub>2</sub> SO <sub>4</sub>	N/A	As

In the above table N/A represents Not Applicable



### Section 10 – Stability & Reactivity

**Stability:** The battery and its contents are stable.

**Conditions to avoid:** Overheating and overcharging as Sulfuric acid mist and hydrogen can be generated.

**Materials to avoid:** Strong alkaline materials, conductive metals, organic solvents, sparks and open flame.

**Hazardous decomposition of byproducts:** Hydrogen gas may be generated in an overcharge condition, in fire or at very high temperatures. In fire may emit Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Hydrogen (H), sulfur oxides as well as toxic fumes from decomposition of case material.

**Hazardous polymerization:** Hazardous polymerization will not occur.

### Section 11 – Toxicological Information

Non-spillable batteries are sealed and do not leak or vent gasses under normal conditions. Venting of sulfuric acid gas and hydrogen can occur under severe overcharge conditions. If battery is ruptured or damaged exposure to sulfuric acid electrolyte and lead can occur. Exposure is a significant risk during reclaim operations.

#### Acute Toxic Data

Components	CAS Number	OSHA Regulatory Status	LD <sub>50</sub>	LC <sub>50</sub>
Lead (Pb)	7439-92-1	Hazardous	Unavailable	Unavailable
Lead Dioxide (PbO <sub>2</sub> )	1309-60-0	Hazardous	Unavailable	Unavailable
Lead Sulfate (PbSO <sub>4</sub> )	7446-14-2	Hazardous	Unavailable	Unavailable
Calcium (Ca)	7440-70-2	Hazardous	2000 mg/Kg (rat, oral)	Unavailable
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	7664-93-9	Hazardous	2140 mg/Kg (rat, oral)	510 mg/m <sup>3</sup> / 2 hours (rat, inhalation)
Arsenic (As)	7440-38-2	Hazardous	763 mg/Kg (rat, oral)	Unavailable

See “Section 2 – Hazards Identification” for more information on human toxicity.

#### Subchronic Toxicity Data

See “Section 2 – Hazards Identification” for more information on human toxicity.

#### Carcinogenicity

##### Lead (Pb)

Several reports have been published indicating that certain lead compounds administered to animals in high doses are carcinogenic, primarily inducing renal tumors. Salts demonstrating carcinogenicity in animals are usually soluble salts. No studies have shown a relationship between lead exposure and cancer in lead workers. However, one study of lead-exposed workers demonstrated a statistically significant elevation in the standardized mortality ratio for gastric and lung cancer in battery plant workers.

Cont’d...



## Section 11 – Toxicological Information ...continued

### Carcinogenicity [Lead (Pb)]...continued

- Lead (Pb):** Lead has been deemed carcinogenic by the following agencies
- ACGIH:** Classes Lead as an A3 Animal Carcinogen
  - OSHA:** Possible select carcinogen
  - IARC:** Group 2B carcinogen (Animal)
  - State of California:** carcinogen; initial date 10/1/92
  - NTP:** Reasonably anticipated to be a human carcinogen.

### Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>)

Many studies have reported more cancer of the larynx, and to a lesser extent the lungs, than expected, in a wide variety of processes involving the use of strong inorganic acids including sulfuric acid. Throughout these studies, sulfuric acid mists were the most common exposure, and in two studies, the number of cancers increased as exposure increased. Several of the studies had design weaknesses, such as exposure to other potentially carcinogenic chemicals at the same time. Nevertheless, some studies were well conducted and the overall trends indicate that occupational exposure to strong inorganic mists containing sulfuric acid is carcinogenic to humans.

- Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** Sulfuric acid vapour has been deemed carcinogenic by the following agencies
- IARC:** Group 1 carcinogen (Human) (Applies to vapour but not to liquid state).
  - NTP:** Known human carcinogen (Applies to vapour but not to liquid state).

### Mutagenicity

**Lead (Pb):** No Data Available

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** There was a significantly higher number of sister chromatid exchanges, micronuclei and chromosomal aberrations in cultured lymphocytes (white blood cells) from workers exposed to sulfur dioxide in a sulfuric acid factory. There was no correlation with length of service. No conclusions can be made based on these observations.

### Teratogenicity

**Lead (Pb):** Lead penetrates the placental barrier and has caused fetal abnormalities in animals. Excessive exposure to lead during pregnancy has caused neurological disorders in infants.

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** No human information is available. One animal study indicated that sulfuric acid is not teratogenic, even at maternally toxic doses.

### Reproductive Effects

**Lead (Pb):** Reproductive effects from lead have been documented in animals of both sexes. In battery workmen with a mean exposure of 8.5 years to lead, there was an increased frequency of sperm abnormalities as compared to a control group.

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** No human or animal information is available.

### Neurotoxicity

**Lead (Pb):** Subtle neurological effects from lead have been demonstrated with relatively low blood levels of lead. The performance of lead workers on various neurological tests was mildly deduced when compared with a control group. Anxiety, depression, poor concentration, forgetfulness, mild reductions in motor and sensory nerve conduction velocities have been documented in lead-exposed workers.

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** No human or animal information is available.

Cont'd...

## Section 11 – Toxicological Information ...continued

### Irritancy of Product

**Lead (Pb):** Lead dust may cause skin irritation.

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** Sulfuric acid can cause severe burns to eyes and skin.

### Sensitization (Potential Allergen)

**Lead (Pb):** lead and lead compounds are not known to be skin sensitizers.

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** Sulfuric acid can cause severe burns to eyes and skin. There is no data available on sensitization.

### Potential for Accumulation

**Lead (Pb):** Lead accumulates in the body throughout one's lifetime.

**Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>):** Sulfuric acid is absorbed through mucous membranes, ultimately into the bloodstream. The sulfate anion becomes part of the pool of sulfate anions in the body and is excreted in the urine in combination with other chemicals in the body. It is unlikely to accumulate in the body.

**Battery terminals contain lead. After contact with terminals, wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses.**

## Section 12 – Ecological Information

Lead and lead compounds can pose a threat if released into the environment. Lead is an extremely stable metal. While some corrosion may be expected in soil, generally an inert coat of insoluble salt will form and limit further corrosion. Lead particles will sink in water and stay in the sediment, however in fast moving water lead may be spread. Small amounts of lead in water can lead to accumulation in living organisms over time. Batteries in landfill sites have contributed to lead leaching into ground water.

Sulfuric acid is harmful to aquatic life even in very low concentrations. It may be dangerous if it enters water intakes. Aquatic toxicity for Bluegill (*Lepomis macrochirus*) in fresh water was 24.5 ppm / 24 hrs, which was lethal. LC<sub>50</sub> for Flounder was 100 to 330 mg / l / 48 hrs.

## Section 13 – Disposal Considerations

**Waste Disposal Method:** Non-spillable batteries are recyclable. It is an offence to dispose of lead-acid batteries by any means other than recycling. Do not dispose of in regular household garbage. Contact GS Battery – Canada for information on disposal.

**Ontario:** Must be recycled in an Ontario Ministry of the Environment approved facility, permitted to receive Ontario Waste Class 112.

**United States:** U.S. law requires that chemical waste generators must determine whether a discarded material is classified as hazardous waste. Use U.S. EPA guidelines for the classification of hazardous waste listed in 40 CFR 261.3. Additionally, consult state and local hazardous waste regulation to ensure complete and accurate classification.

**Hazardous Waste Class/Code:** Not applicable to finished product as manufactured for distribution into commerce. Batteries are considered hazardous goods (UN2800) when being transported for reclamation (recycling). US EPA hazardous waste code D002 (corrosivity) and D008 (lead) apply to spent batteries only.

## Section 14 – Transport Information

### United States

**U.S. Department of Transportation (DOT):** Non-spillable wet electric storage batteries are regulated by the U.S. DOT under the Hazardous Materials Regulations (HMR). Exemptions are made if certain criteria are met. GS Portalac, Superlac and Goldtop batteries **meet** the test requirements for “nonspillable wet electric storage batteries”, as provided in 49 CFR 173.159(d), and therefore are **non-regulated by DOT**, for surface transportation, when protected against short circuits and securely packaged. (These data refer to undamaged batteries). The outer packaging must be plainly and durably marked “NONSPILLABLE”.

This exemption does not apply to spent batteries being transported for reclamation (recycling). When shipping spent batteries the following applies:

**Proper shipping name:** Batteries, wet, non-spillable  
**Hazard Class/Division:** 8  
**Identification Number:** UN2800  
**Packing Group:** III  
**Label Required:** No (Class 8) label required

### Canada

**Transport Canada:** Non-spillable wet electric storage batteries are regulated by Transport Canada under the Transportation of Dangerous Goods Act (TDG). Exemptions are made if certain criteria are met. GS Portalac, Superlac and Goldtop batteries **meet** the test requirements for “batteries, wet, non-spillable”, as specified in Schedule 2 Special Provision #39 (2) of the Transportation of Dangerous Goods Act, and therefore are exempt and **non-regulated by Transport Canada**, for surface transportation, when protected against short circuits and securely packaged. (These data refer to undamaged batteries). The outer packaging must be plainly and durably marked “NONSPILLABLE”.

This exemption does not apply to spent batteries being transported for reclamation (recycling). When shipping spent batteries the following applies:

**Proper shipping name:** Batteries, wet, non-spillable  
**Hazard Class/Division:** 8  
**Identification Number:** UN2800  
**Packing Group:** III  
**Label Required:** No (Class 8) label required

### International

**IATA:** GS Portalac, Superlac and Goldtop batteries are safe for air transport, as they have met the testing requirements put forth in Special Provision # A67 of the IATA Dangerous Goods List. No label required.

**IMO:** GS Portalac, Superlac and Goldtop batteries are safe for marine transport, as they have met the testing requirements put forth in Special Provision SP238 of the IMDG code. No label required.

Certificate of Testing documentation for the above exemptions and special provisions is available from GS Battery – Canada on request.

## Section 15 – Regulatory Information

### U.S. Federal Regulations

**TSCA:** The following ingredients are listed in the TSCA Registry as follows:

CAS# 7439-92-1 (lead), CAS# 1309-60-0 (lead dioxide), CAS# 7446-14-2 (lead sulfate), CAS# 7440-70-2 (calcium), CAS# 7440-31-5 (tin), CAS# 7664-93-2 (sulfuric acid) and CAS# 7440-38-2 (arsenic).

**RCRA:** Spent lead-acid batteries are not regulated as hazardous waste when recycled. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity). Exposed lead is a hazardous waste; EPA hazardous waste number D008 (lead).

**CERCLA (Comprehensive Response Compensation, and Liability Act):**

Reportable quantity (RQ) for spilled 100% sulfuric acid (CAS# 7664-93-2) under CERCLA is 1000 lbs. (454 Kg). State and local reportable quantities for spilled sulfuric acid may vary.

**SARA Title III (Superfund Amendments and Reauthorization Act)**

Supplier Notification: This product contains toxic chemicals that may be reportable under Section 313 Toxic Chemical Release Inventory (Form R) requirements. CAS numbers and % by weight information is provided in the table in Section 3 of this document.

**EPCRA:**

Sulfuric acid is listed “Extremely Hazardous Substance” under EPCRA (Emergency Planning and Community Right to Know Act), with a Threshold Planning Quantity (TPQ) of 1000 lbs. (454 Kg).

- a) Section 302 notification is required if 1000 lbs (454 Kg) or more of sulfuric acid is present at one site. The average non-spillable battery contains less than 2 lbs. (0.9 Kg) of sulfuric acid.
- b) Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of 500 lbs. or more and / or if lead is present in quantities of 10,000 lbs. or more.

**Clean Air Act (CAA):** This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 ozone depleters.

This material does not contain any Class 2 ozone depleters.

**Clean Water Act (CWA):** Sulfuric acid is listed as a Hazardous Substance under the CWA.

### State Regulations

**California Proposition 65:** The following chemicals identified to exist in the finished product as distributed into commerce are known to the State of California to cause cancer, birth defects, or other reproductive harm: Arsenic, Sulfuric Acid and Lead. CAS numbers and % by weight information is provided in the table in Section 3 of this document.

<b>California Proposition 65 Label</b>
<b>Warning:</b> Battery, posts, terminals and related accessories contain lead, lead compounds and other chemicals known to the State of California to cause cancer or birth defects and other reproductive harm. <b>Wash hands after handling.</b>

<b>California Consumer Product Volatile Organic Compound Emissions</b>
This Product is not regulated as a Consumer Product for purposes of CARB/OTC VOC Regulations, as-sold for the intended purpose and into the Industrial /Commercial supply chain.

**Right to Know Legislation:** Sulfuric acid, lead and lead compounds, calcium, tin and arsenic can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, and Massachusetts.

Cont'd...

## **Section 15 – Regulatory Information...continued**

### **Canadian Regulations**

#### **Canadian Domestic Substance List (DSL)**

All ingredients remaining in the finished product as distributed into commerce are included on the Domestic Substances List.

**WHMIS Classifications:** Class E: Corrosive materials present at greater than 1%. This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by those regulations. Lead, lead dioxide, lead sulfate, calcium, tin, sulfuric acid and arsenic are listed on the DSL list and the Ingredient Disclosure List. CAS numbers and % by weight information is provided in the table in Section 3 of this document.

#### **NPRI and Ontario Regulation 127/01**

This product contains the following chemicals subject to reporting requirements of Canada NPRI and/or Ontario Regulation 127/01: Lead, Sulfuric Acid.

CAS numbers and % by weight information is provided in the table in Section 3 of this document.

### **European Regulations**

#### **European Inventory of Existing Commercial Chemical Substances (EINECS)**

All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

#### **European Communities (EC) Hazard Classification according to:**

**Dangerous Substances Directive 67/548/EEC and Dangerous Preparations Directive 1999/45/EC.**

R-Phrases: 35, 36, 38, 45, 51

S-Phrases: 2, 26, 30, 45

#### **Classification, Labeling & Packaging (CLP) Regulation no. 1272/2008 and Registration, Evaluation, Authorization and restriction of CHEMicals (REACH) Regulation no. 1907/2006.**

These products are manufactured articles and not subject to CLP and REACH registration requirements.

#### **Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)**

GS Portalac, Superlac and Goldtop batteries are exempt from RoHS restrictions for lead content. Supporting information is available from GS Battery – Canada on request.

## **Section 16 – Other Information**

This entire document has been revised to comply with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) for MSDS in order to maintain consistency throughout Canada (CPR & WHMIS), the United States (ANSI Z400.1-2004), Europe (Directive 91/155/EEC & CLP) and Japan (MITI Official Notice #1). Every effort has been made to ensure that this document meets all the requirements of these standards at the time of publication. (November 26, 2014) MSDS-GSBC-5R0.

Vendee and third persons assume the risk of injury proximately caused by the material if reasonable safety procedures are not followed as provided for in the MSDS. Vendor shall not be liable for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable procedures are followed.

All persons using this product, all persons working in an area where this product is used, and all persons handling this product should be familiar with the contents of this MSDS. This information should be effectively communicated to employees and all others who might come in contact with this product.

The information contained herein is based on data considered accurate as of the date hereof, however, no warranty is expressed or implied regarding the accuracy of these data or the results obtained from the use thereof.